



SHELL-O-GRAM

Official Publication of the
JACKSONVILLE SHELL CLUB, INC.

July, August _____ Volume 62 (no. 4)

Jacksonville Shell Club, Inc.
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Although meetings are currently suspended until further notice, the club customarily meets monthly at the Southeast Branch of the Jacksonville Public Library, 10599 Deerwood Park Blvd., Jacksonville, Florida <<https://www.jaxpubliclibrary.org/locations/southeast-regional>>. Please address any correspondence to the club's address above. Annual membership dues are \$15.00 individual, \$20.00 family (domestic) and \$25.00 (overseas). Lifetime membership is available. Please remit payment for dues to the address below and make checks payable to the Jacksonville Shell Club. The club's newsletter and scientific journal, the *Shell-O-Gram* (ISSN 2472-2774) is issued bimonthly and mailed in hardcopy to certain members and no less than ten scientific institutions with permanent libraries. An electronic (pdf) version, identical except for "live" URL's and color (vs. B&W) images, is issued the next day and sent to about 200 individuals who have demonstrated an interest in malacological research. These pdf's (ISSN 2472-2782) have also been posted to <<http://jaxshells.org/letters.htm>> since November, 1998. We encourage members and friends to submit articles for publication. Closing date for manuscript submission is two weeks before each month of publication. Articles appearing in the *Shell-O-Gram* may be republished provided credit is given the author and *Shell-O-Gram* Editor-in-Chief. As a courtesy, the editor and author should receive a copy of the republication. Contents of the *Shell-O-Gram* are intended to enter the permanent scientific record.

Membership Dues are payable in **September** each year.
If you're not paid up, please send in your dues: Individual \$15.00; Family
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Harry G. Lee, Treasurer, JSC
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Recent encounters with apple snails and Snail Kites*

by William Aley

Since March 1, 2020 I have been working as an environmental consultant for a dredging project on the Okeechobee Waterway in Stuart, Martin County, Florida. In general, the project is using a hydraulic cutter-suction dredge to remove shoaled sediment from the waterway by mixing it with water to create an approximate 80/20 water to sediment slurry and pumping the stuff through several miles of pipeline to deposit it in what is referred to as a dredged material management area (DMMA). The DMMA is essentially a large man-made basin, surrounded by earthen embankments and containing a weir or water control structure, which allows the contractor to deposit the slurry on one side of the basin and the sediment to settle out of the



water, so that clarified, sediment free, water can be drained off by the weir and returned to the waterway (L). This project is one of many ongoing waterway maintenance projects funded by the U.S. Army Corps of Engineers and the Florida Inland Navigation District (FIND). If you live on the east coast of Florida, you can check your annual property tax bill and see that a small amount of your property tax goes to "FIND" for ongoing maintenance of our inland waterways. One of the things our tax money is used by the FIND for is to purchase

property and construct these DMMA's for management of material dredged from our inland waterways. Having been involved in permitting, designing, and constructing several of these sites, I know that the state environmental agencies generally look at dredging and dredged material management the same way as they do handling of contaminated sediments. This could not be further from the truth. In fact, most of these types of projects I have been involved with should rather receive mitigation credits for a number of positive environmental benefits produced by them including cleaning untold amounts of trash from the waterways, removing nitrogen containing sediments (muck) from the waterways, and creation of thriving man-made wetlands by construction of the DMMA's.

Specifically, my job on this project has been to monitor water clarity and potential interactions with endangered species. This location had high potential for presence of the endangered Eastern Indigo Snake and nesting shorebirds. In the end we have had no interactions with the Eastern Indigo Snake, and no shorebirds attempted to nest within our work area. On the other hand, I was delighted to find that the DMMA was loaded with apple snails, *Pomacea* (R), and there was a large colony of the endangered



Snail Kite (**R**) living just offsite, well away from our work areas, thriving on an apparent endless supply of those snails, their main food source.

I have spent nearly three months having the daily opportunity to observe interactions between the snail population and several bird species living off of them in the vicinity of the DMMA.

The size and prosperity of the Snail Kite population at this site

is remarkable since Florida Fish and Wildlife Conservation Commission has reported that in some recent years only a dozen or so Snail Kite breeding pairs have been documented in Martin County. One can easily search the internet for more information on the status and importance of the Snail Kite in the Everglades ecosystem.



It is the general consensus that, due to changes in operations of Lake Okeechobee and declining water quality, the majority of the Snail Kite population has moved north near the Kissimmee River Basin and feeds mostly on non-native varieties of apple snails. In any case, this DMMA site has proved to be a man-made Garden of Eden for apple snails and the Snail Kites of Martin County, Florida (breeding pair on **L**).

My initial inclination was to assume that the snails present at this site were the native Florida Apple Snail, *Pomacea paludosa* (Say, 1829).

However, in initial correspondence with fellow Jacksonville Shell Club members Dr. Harry Lee and Bill Frank it was pointed out that my specimens were in fact non-native varieties of either *Pomacea maculata* (G. Perry, 1810) or *Pomacea canaliculata* (Lamarck, 1822). My efforts to dive deeper into a definite identification of the snail specimens encountered, with expert assistance from Mr. Frank, sent me into a rabbit hole of the subtleties of *Pomacea* taxonomy which was far deeper than I could have imagined. Four different *Pomacea* species can be found in Florida with *P. paludosa* being the only one naturally occurring in Florida. *P. paludosa* is also the largest freshwater gastropod native to North America.



To the dismay of my specific identification attempts, it turns out that of the four *Pomacea* species to be found in Florida, interspecific overlap and intraspecific variability is great; thus, shell morphology alone cannot reliably verify species identity. Molecular and anatomical techniques are the only way to confidently distinguish between *P. maculata* and *P. canaliculata*. To confound the issue further, the ranges of the native and non-native species overlap in Florida. After several days of digesting literature on taxonomy of *Pomacea* species occurring in Florida, I am content with describing the snails I've observed and collected as "non-native apple snails."

As a mollusk enthusiast and shell collector, I had my job made easier by the Snail Kites, who had already cleaned out the apple snails later strewn all over the site. They even left scoured the opercula often dropped right next to the shells (R). Most of the cleaned snails were found in perfect condition. However, occasionally some shells had holes in them, presumably made by juvenile Snail Kites or other birds which also feed on the apple snails at the site. Limpkins and Boat-Tailed Grackles were occasionally observed feeding on the snails. In one instance I even observed an ant colony that had built a mound around a snail that was presumably dropped by a bird. Several days later the snail shell remained, although empty, and the ants had moved on. In the water, I observed the snails attached to



structures and vegetation as well as swimming freely through the water at the surface or just below it (L). The birds would prey on free-floating, attached, and submerged snails. Since the water being pumped into the site is brackish, measured salinity within the DMMA has ranged from 0 – 11 ppm chloride [sea water is about 35 ppm] with no apparent effect on quality of life for the snails. Among the thousands of *Pomacea* observed over the last few months I have seen the spectrum of morphological and color variants and have kept a keen eye out for potential sinistral variants ---- with no luck yet ---- and kept a dozen or so specimens for my personal collection. I was able to gather a nice assortment of the various sizes and shape and color variants. While it is documented that apple snails of the varieties found at this site can exceed 100 mm in height, the largest specimens I found discarded by the birds were ~75 mm. In the midst of my *Pomacea* research rabbit

hole I learned that birds tend to prey primarily on medium-sized snails. This probably explains why, of the thousands of discarded empty shells encountered, I have not yet found any at the top end of the known size spectrum.

Non-native apple snail species have been documented in Florida since at least the late 1980's. As far as non-native (invasive) species go, the emergence of non-native *Pomacea* in Florida ecosystems has been a double-edged sword for Everglades Snail Kites and their natural food source, the native *P. paludosa*. The non-native *Pomacea* varieties tend to be more fecund, producing more and faster growing juveniles, creating a new found abundance of food that appears to be helping the once highly depleted population of Snail Kites to rebound. There are concerns, however, that the combination of higher fecundity and higher feeding rates of the non-native *Pomacea* and the growing population of Snail Kites could put untold stress on the native *P. paludosa*. Paradoxically, the presence of a relatively recently introduced non-native species is leading to the recovery and success of Snail Kite which could lead to the demise of the native Florida Apple Snail.

Photo Credit: The Snail Kite pictures included in this article were taken by a friend and professional photographer, Romeo Ghete, whom I invited out to greatly improve on my novice attempts at iPhone photography and to acquire some images that would do better justice to the beauty of the birds, as he well did. Romeo photographs sports professionally; his nature photography is strictly a hobby. Anyone who has Facebook can search his name and find the hundreds of wildlife photos that he shares on a nearly daily basis.

Editor's notes:

1. William Aley is an Environmental Biologist and long-term Jacksonville Shell Club (JSC) member. His grandmother, Billie Brown, is a JSC past-president and a member for nearly 50 years.
2. The Snail Kite was known for years as the Everglades kite, but the name was changed under the plenary powers of the North American Classification Committee of the American Ornithological Union (now the American Ornithological Society), which serially publishes the *Checklist of North and Middle American Birds*.
3. The use of upper case initials for official vernacular names of plants and animals is defended at <http://www.jaxshells.org/flatcoil.htm>; a number of malacologists have followed suit.

A second 21st century find of a living Atlantic Geoduck in NE Florida

by Mark Johnson and Harry G. Lee

Spurred by the reports of big *Strombus alatus*, e.g., <http://www.jaxshells.org/ds14.htm>, I (MJ) made the trip from North Charleston, SC to Davis Shores, just across the Matanzas River from Historic St. Augustine. From the northern point of this community on Anastasia Island is a sizable mud/sand flat extending seaward and almost reaching the western end of St. Augustine Inlet's south jetty [R]. Under a few feet of water most of the time, the afternoon of Sunday, March 29, 2021 was predicted to bring a spring low tide, and most of this several acre tract would be left high and dry for an hour or two,



optimizing the opportunity to observe, and perhaps sample, this colony of Florida Fighting Conchs (FFCs). These are not just your average FFCs but a population with gargantuan shells - averaging ~ 105mm and up to 116mm in height; a significant percentage exceeding the listed world record (Jones & Frank, 2017). and unusually black parietal shields as demonstrated at the URL above. Further back in my mind was the recent report by a fellow JSC member of the recent occurrence of another behemoth, the largest infaunal bivalve in the American Southeast recently found living a few miles south in a similar habitat (Jones, 2020).



By 4:00 PM the predicted minus tide was fully manifest, and I was on the flat. The FFCs were popping out of the substrate and immediately captured my attention. My preoccupation with that gastropod gallimaufry notwithstanding, something very different caught my eye. Reminiscent of an active Angelwing burrow, a sight deposited my search image bank from JSC Cedar Key outings [L], the soft object had the two fused siphonal openings, but it extended an inch **above** the substrate.

Recalling the Jones (Idem)

account, I suspected this might be a geoduck. As the seconds wore on to minutes during the tedious excavation that followed, it gradually became apparent that the living animal was certainly a clam, was far more fleshy than an Angelwing, and was not giving up easily. Eventually I brought it to the surface, rinsed it off, and took its picture [R]. Over a foot in length despite its siphon being contracted at least three-fold from the time of discovery, it's the undisputed "champion clam" of FL.



Knowing the history of the Davis Shores flat, I find it interesting how some species are cyclic and pop up/die off as the years roll by. Looking at my and Paul's finds, I'm reasonably sure the geoducks will be found (albeit rarely) for some time, then disappear again. I hope the population remains healthy as they are indeed special animals. I imagine they may cycle out over the next few years as the conditions change and the colony finds another area of bottom, perhaps in deeper water. The shell of my specimen measures 153mm (just over six inches). It was just collected at 4:00 PM on Sunday, 29 March 2021. The tide was very low, but the elevation was such that a reasonable low tide would have exposed it.

I don't mind a bit sharing the collecting data. Readers may wish to use their discretion as to the information (for reasons that are about to become apparent). The shell was collected on the big flat east of Inlet Drive at Davis shores. I sent an image with the exact spot annotated in red. This flat also houses a population of large and beautiful *S. alatus* fighting conchs (also potentially vulnerable). I certainly did not discover this area on my own but rather through discussions with others, including my co-author, so I, of course, would not keep this information secret. I have left it up to the editor as to whether or not the exact locality is something to place in the scientific record.

Jones, P., 2020. JSC members' find of an Atlantic Geoduck. *Shell-O-Gram* 61(2): 3-6. November. <[Shell-O-Gram Nov.-Dec., 2020 \(jaxshells.org\)](#)>

Jones, P. and W. Frank, 2017. A surprise find of a colony of live *Strombus alatus* Gmelin, 1791 in St. Augustine Inlet. *Shell-O-Gram* 58(4): 5-7. July. <[Shell-O-Gram Nov.-Dec., 2020 \(jaxshells.org\)](#)>

Prequel to the above: a reflection on 19th century observations of the Atlantic Geoduck

It appears that the discovery of this species, at least by a scientist, dates to March, 1859 (Stimpson, 1860: 444). The specimen(s) were found Beaufort Harbor by the author, reporting "the occurrence of species hitherto known as Tertiary fossils, such as species of *Panopaea* These were found either alive or in such condition as showed them to be Recent shells, which would have doubtless been found alive upon further search." He went on to list *Panopaea americana* [sic] without attribution, as were the vast majority of the 170-odd marine mollusks listed. It appears nearly certain that he was citing *Panopea americana* Conrad, 1838 (p. 4, pl. 2) as he gave that attribution to the binomen two years later (Stimpson, 1862: 3, species 232). Although many authorities, e.g., MolluscaBase <<http://molluscabase.org/aphia.php?p=taxdetails&id=542320>>, refer to the Stimpson binomen as a homonym of the earlier Conrad taxon (permanently invalid), it is correctly interpreted as a mere misidentification of that extinct fossil geoduck species. The only other option would be to consider Stimpson's taxon a *nomen nudum*, since no indication or description was provided. Nonetheless, the fact remains that William Stimpson found the first Atlantic Geoduck on record!

Conrad (1872) described *Glycimeris*¹ *bitruncata* from one of two specimens collected in Fort Macon, NC by A.C. Beals and sent to him in Philadelphia by a Dr. Yarrow. Like Stimpson (*loc. cit.*), he opined "I suppose it to be a Recent shell, on account of its polish, and part of the unaltered ligament remaining."

Less than a dozen years later (1883 fide Lyons, 1994) the **first living specimen** of the Atlantic Geoduck was

found (Johnson, 1904; briefly mention by Johnson, 1890: 4). Charles W. Johnson excavated it from sandy mud near Marsh Island, St. Augustine and measured the shell at 133mm in length (nearly an inch less than the specimen presented in the preceding article. Thus the first and latest finds of living Atlantic Geoducks spanned 138 years, occurred within a few hundred meters of Castillo San Marcos in the Nation's Oldest City, in a similar substrate and depth, and by a **man named Johnson!** Consistent with Mark Johnson's prognostication above, Marsh Island had disappeared by the early twentieth century (Johnson, 1919)!

¹of Klein, 1753 [unavailable; validated by Lamarck, 1799] - not of Da Costa, 1778: our Bittersweet Clams

Conrad, T.A., 1838. *Fossils of the Medial Tertiary of the United States. No. 1.* 32 pp., pls. 1-17. <[Fossils of the Tertiary Formations of the United States: Illustrated by ... - Timothy Abbott Conrad - Google Books](#)>

Conrad, T.A., 1872. A description of a new Recent species of *Glycimeris*, from Beaufort, North Carolina, and of Miocene shells from North Carolina. *Proceedings of the Academy of Natural Sciences* 24: 216-217.
<<https://www.biodiversitylibrary.org/page/26296979>>

Johnson, C.W., 1890. Annotated list of the shells of St. Augustine, Fla. *The Nautilus* 4(1): 4-6. May
<<https://www.biodiversitylibrary.org/page/12596630>>

Johnson, C.W., 1904. *Panopea bitruncata* Conrad. *The Nautilus* 18(7): 73-75. November.
<<https://www.biodiversitylibrary.org/page/1816971>>

Johnson, C.W., 1919. An old collecting ground revisited. *The Nautilus* 33: (1): 1-8. July
<<https://www.biodiversitylibrary.org/page/1744508>>

Lyons, W.G., Class Bivalvia Order Myoida Family Hiatellidae *Rare Atlantic Geoduck Panopea bitruncata* (Conrad) pp. 48-51 in Deyrup, M. and R. Franz, 1994. *Rare and Endangered Biota of Florida Volume IV. Invertebrates* University of Florida Press, Gainesville. [i]-xxx + 1- 797.

Stimpson, W., 1860. A trip to Beaufort, N. Carolina. *American Journal of Science and Arts series 2* 29(85): 442-445.
<<https://www.biodiversitylibrary.org/page/36995160>>

Stimpson, W., 1862. Check list of the shells of North America. East coast: Arctic Seas to Georgia. *Smithsonian Miscellaneous Collections* 2 (Article 6 Part 3): 1-6. <<https://www.biodiversitylibrary.org/page/9065630>>

Upcoming meetings

The Jacksonville Shell Club, Inc. (JSC) customarily meets on the **fourth** Thursday (of each month except for November (a week earlier due to Thanksgiving) Function Room D of the Southeast Branch, Jax Public Library <<https://www.jaxpubliclibrary.org/locations/southeast-regional>. At the time of this Shell-O-Gram issue, the meeting room is still closed to the public due to COVID-19 restrictions. Should a meeting be permissible on July 22 and/or August 27, 2021, the active membership will be notified by email. The editorial staff is looking forward to such an announcement in the near term. Meanwhile, we ask the active JSC members and all our readers to remain cautious and comply with CDC recommendations.

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Living Seashells of the Tropical Indo-Pacific

by Andrey Ryanskiy

ISBN 9785604204993 pub: 2020

www.reefidbooks.com

available on Amazon.com:

Kindle edition: \$21.99

Paperback: \$48.99

reviewed by Thomas Eichhorst

On 24 January 2021, I received the following email:

Hello Tom,

Hope you will have time to review this new book for the next issue - that I just emailed Anne Joffe about:

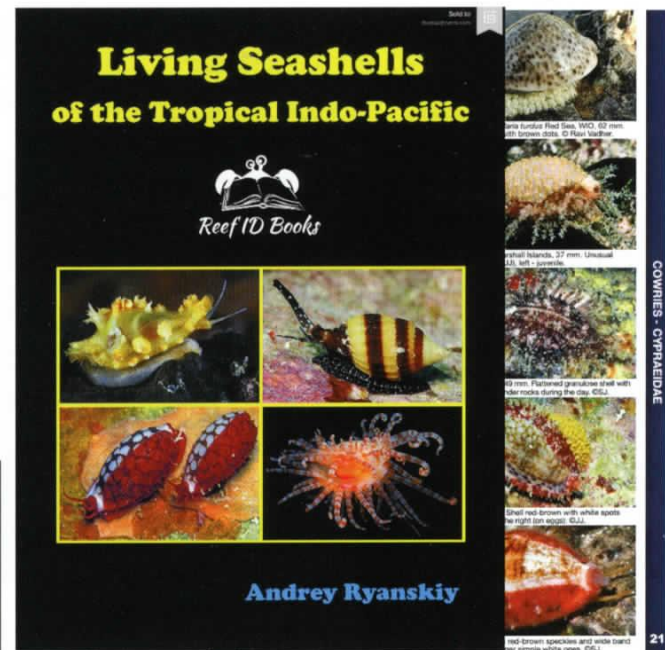
"I just received a very recently published book - with three pages (30 photos) of living chitons - and thought of you. "Living Seashells of the Tropical Indo-Pacific" by Andrey Ryanskiy - Reef ID Books - has fabulous photos (and I don't use that word often) of live species, many taken by Scott Johnson and his wife Jeannette. I knew Scott since I was a member of HMS and lived in Hawaii '68 - '76. He was a student at UH then and just beginning his photography career. Reconnected with him 1/14 and he told me about this new book. I hesitated to order it - it seems to be only available through Amazon, but did, and arrived very quickly."

Since I only collect Hawaii shells - and am very interested in the animals as well as the shells (wanted to study to be a marine biologist, but had three kids - about to go to college themselves). This book is fascinating to me. Hope you will enjoy it as well.

Does COA give you a budget/donate books for you? If not - they should!

Best - Fran Wright, Florida

I whined a bit about buying another general shell field guide (just so my wife understands I am forced into these things), but in the interim, the author, Andrey Ryanskiy, graciously sent me a PDF copy, free of charge. I appreciated this as it saved me some money and I prepared to review the PDF version. **After skimming the PDF, I went online, logged onto Amazon.com, and purchased the paperback edition.** It was immediately obvious that this was an important book that I wanted in hand; an electronic version was just not enough. I cannot imagine a shell library that would not benefit from the addition of this book. There are 2,600 full-color photographs of 1,500 living species of mollusks, and as Fran stated, these are "...fabulous photos." Many of the species are presented here, *in situ*, for the first time ever.



The book includes a brief introduction and some facts and figures about different molluscan classes (gastropods, bivalves, and chitons). It also has a pictorial table of contents by family as well as an index by genera. There is a plate with several living mollusks (four gastropods, one bivalve, and one chiton) with technical morphological terms illustrated with each subject. After these few pages, there is page after page of stunning photographs.

About the book, the Amazon web page states, "It is designed for divers, underwater photographers, snorkelers, shell collectors, beachcombers, and nature lovers." All certainly true, but it should be added that it just might be a "must" for conchologists. A great shell book buy to start off 2021. And let's face it. The price is such that the meal out you are not able to partake in right now would more than cover it.

Ryanskiy's book is one of several he has authored in a series of marine-based field guides, including:

- "Coral Reef Crustaceans from the Red Sea to Papua"
- "Coral Reefs Philippines"
- "Coral Reefs Indonesia"
- "Coral Reefs Maldives"
- "Living Seashells of the Tropical Indo-Pacific"
- "Nudibranchs of the Coral Triangle"
- "Reef Fishes of the Coral Triangle"
- "Starfishes and Other Echinoderms of the Tropical Indo-Pacific"

All are available at Amazon.com in paperback or Kindle electronic versions, or as PDF versions at www.reefidbooks.com. Because I have a drawer full of dried sea stars as well as quite a few preserved crustaceans, I went ahead and ordered the sea star and crustacean books.



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